Research in Management of Technology and Business Vol. 4 No. 1 (2023) 637–648

RMTB

Homepage: http://publisher.uthm.edu.my/periodicals/index.php/rmtb
e-ISSN : 2773-5044

The Intention to Use Smart Home Internet of Things (IoT) among Generation Y: An Application of the Technology Acceptance Model (TAM)

Yap Zi Yuan[1] & Nor Kamariah Kamaruddin[1,*]

[1]Department of Technology Management, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, MALAYSIA

*Corresponding Author

DOI: https://doi.org/10.30880/rmtb.2023.04.01.044
Received 31 March 2023; Accepted 30 April 2023; Available online 01 June 2023

Abstract: Internet of Things (IoT) technology is having an expanding influence on our everyday lives as a result of recent advancements in internet technologies, and it is beginning to offer intriguing and beneficial new services. Due to IoT growth is still in its early stages, comprehending the problem from the standpoint of individual customers has received little attention. This research seeks to evaluate a technology acceptance model of variables impacting consumer adoption of IoT technology, given the significance of the new technology and the difficulties of comprehending the customer. The research aims to apply Technology Acceptance Model (TAM) in determining intention to use Smart Home IoT technology. Based on Technology Acceptance Model (TAM), the authors proposed an IoT acceptance model that consists of two variables that are perceived usefulness and perceived ease of use. The respondents of this research will involve among the Generation Y in Johor. The research will adapt quantitative research method whereby survey questionnaire be used as data collection tool. The response rate was 75.52% which was 290 out of 384 and all of the questionnaires collected were usable. Data have been analyzed by using SPSS (Statistic Package for Social Sciences) statistical software. The resulted of this research shows level of intention to use Internet of Things (IoT) had high mean score which is 4.16, perceived usefulness with Intention to use Internet of Things (IoT) had high mean score which is 4.27 and perceived ease of use with intention to use Internet of Things (IoT) had high mean score which is 4.28.

Keywords: Internet of things (IoT), Smart home, Generation Y, Technology acceptance model (TAM)

Corresponding author: nkamariah@uthm.edu.my

1. Introduction

The internet of things (IoT) refers to items that can connect with one another through the internet (Uckelmann *et al.*, 2011). IoT technologies have received a lot of attention and have a lot of applications in a lot of sectors (Schlick *et al.*, 2013). The study utilized smart homes as a specific application category for IoT usage. A smart home means your home has a smart home system that connects with your appliances to automate specific tasks and is typically remotely controlled. According to recent research, IoT devices are popular with all age ranges yet the Generation Y are the most reliant and most frequent users of modern technologies (French & Shim, 2016). Generation Y is known as digital natives, millennial are those born between 1981 and 1996 and technology is part of their everyday lives and all their activities are mediated by a screen. Gen Y are heavy users of digital technologies and social media and may have altered brain structures and thinking patterns compared to earlier generations because of their high exposure to technology early in life (Prensky, 2001; Barak, 2018; Perkovic *et al.*, 2018).

Due to the internet of things (IoT) growth is still in its early stages, comprehending the problem from the standpoint of individual customers has received little attention. Acceptance of IoT technology is contingent on a user's view of its utility and ease of use. This research seeks to create and experimentally evaluate a causal connection model of variables impacting consumer adoption of IoT technology, given the significance of the new technology and the difficulties of comprehending the customer. Previous research has limited investigated the impacts of technology model on consumer acceptance of IoT technologies in smart home (Gao & Bai., 2010). Hyun Gi Hong (2016) described that technology factors, such perceived ease to use and perceived usefulness affect the users' adoption of IoT technology. Given the high practical relevance and dearth of prior empirical work, the current research aims to investigate the technological factors determining consumers' acceptance of IoT technology in smart home. Along with the advancements IoT provides, there are some issues that potential users still have not figured out which causes apprehension of adapting this new technology. (Hande, 2019) Most previous research on this concept has concentrated on the technical issues of IoT usage but neglected the IoT users and their intention about the technology (Lin & Dong, 2018).

Therefore current study conducted to determine the level of intention to use Internet of Things (IoT) among the Generation Y and to identify the relationship between perceived usefulness with intention to use Internet of Things (IoT) in Johor. Relationship between perceived ease of use with intention to use Internet of Things (IoT) also identified.

This study is to identify the level of the intention to use Smart Home Internet of Things (IoT).This research will apply the quantitative method. The target respondents of this study is Generation Y, the current age is 26 to 41. This study will employ the questionnaire to collect the data. The data are gathered by distributing questionnaires to the Generation Y in Johor. A set of surveys will be distributed to the respondents for answering the questions. The survey was distributed through social media. The researcher used Statistical Package for the Social Sciences (SPSS) software to analyse the data quantitatively.

This study was conducted to identify level of the intention to use Internet of Things (IoT) application in Smart Home among the Generation Y in Johor. This research helps researchers more understand what the level of intention to use Internet of Things (IoT). Therefore, this research focuses on and studies in detail of Technology Acceptance Model (TAM) to determining intention to use Smart Home IoT technology. In addition, it is important to the smart home industry to determine the level intention to use Internet of Things (IoT) application in Smart Home of Generation Y in Johor.

2. Literature Review

In this section, the researcher will focus on the independent variables and dependent variables to understanding the current situation and the relationship between both variables. The main purpose of this Chapter is to view the definitions, concepts and theories about the intention to use Internet of Things (IoT) in smart home among the Generation Y in Johor.

2.1 Intention to use Technology

Behavioral intention is often predicted on the basis of multiattribute models (Fishbein and Ajzen, 1975). TAM (Davis 1989) is a multiattribute model that predicts users' intentions to utilize technology based on their views of the system's usability and utility. Eagly and Chaiken (1993) described behavioural intentions as a person's conscious plan to expend effort to carry out a certain behaviour, with these intentions built from both a personal evaluative and a normative construct. Customers' behavioural intentions were categorised as either positive or negative in Zeithaml, Berry, and Parasuraman's key study (1996). Good behavioural intentions result in the formation of bonds with the firm, greater business volume, positive acclaim for the company, and readiness to pay a premium price. Customers' capacity to say nice things about them, promote them to other consumers, stay loyal to them (i.e., repurchase from them), spend more with the firm, and pay price premiums are all examples of favourable behavioural intents, according to Zeithaml *et al.* (1996).

2.2 Internet of Things (IoT)

The concept of the Internet of Things (IoT) refers to the interconnection of various objects through the internet, as stated by Uckelmann *et al.* (2011). To achieve this, items are equipped with a microprocessor and a communication antenna, as explained by Deutsche Welle (2012). This technology has garnered significant attention and has many applications in different sectors, owing to the convergence of multiple technologies such as ubiquitous computing, commodity sensors, powerful embedded systems, and machine learning, as noted by Schlick *et al.* (2013). In this regard, IoT technology is expected to affect consumer behavior in various aspects of their daily lives (Li and Wang, 2013). The Internet of Things is made possible by conventional domains such as embedded systems, wireless sensor networks, control systems, and automation, including home and building automation. In the consumer market, IoT technology is most commonly associated with the "smart home" concept, which features home appliances like lighting fixtures, thermostats, cameras, and security systems that can be controlled using devices connected to that ecosystem, such as smartphones and smart speakers.

2.3 Internet of Things (IoT) in Smart Home

Even though the idea of home automation has been around since the 1980s (Horrigan, 1987), including home security systems, motion-sensor lighting systems, and automated garage doors and gates, it is the recent emergence of the Internet of Things (IoT) that has sparked renewed interest in the concept of the smart home. While most modern homes already have some level of automation due to built-in sensors or electronic controllers in appliances, this is not exactly what is meant by a smart home today. IoT smart homes take automation a step further by introducing centralized control, allowing devices to communicate with each other and with the user to create a personalized environment that matches their lifestyle. This concept includes interconnectivity and contextual adaptation as essential attributes (Yang, Lee and Lee, 2018). A smartphone app or web portal is necessary to interact with the automated system, which is now capable of monitoring users' activities and internal environments and providing specific services to meet their needs. For example, Amazon Echo and Google Home are central hubs for smart home gadgets with voice-activated assistants, providing comfort in homes. Chinese manufacturer Xiaomi has developed an intelligent remote-control module that can be inserted into all home appliances, such as refrigerators, air purifiers, air conditioners, and washing machines.

Additionally, Apple HomeKit provides voice support as a hub to communicate, configure, and control smart devices in the Apple kit.

2.4 Determinants of Intention to Use Internet of Things (IoT)

This study utilizes the Technology Acceptance Model (TAM) to examine the variables that impact the intention to use the Internet of Things (IoT) in smart homes. TAM, originally developed by Davis in 1989, is a multiattribute model that predicts users' intentions to utilize technology based on their perceptions of its usability and utility. It is based on the Theory of Reasoned Action and assumes that users' adoption of a technology is primarily determined by a cognitive process aimed at maximizing its usefulness. TAM has been widely applied and proven to be a parsimonious model with high explanatory power of users' acceptance related to IT adoption and usage across different contexts. Therefore, this research adopts TAM as its theoretical base to explain the factors that affect users' acceptance of IoT in smart homes, including dimensions that can influence respondents' attitudes towards the technology. The TAM model is rooted in psychological theory and posits that user behavior is based on perceived usefulness and perceived ease of use, with the ultimate goal of explaining the main factors of user behavior towards technology acceptance.

(a) Perceived usefulness

According to Davis, perceived usefulness as the extent to which the use of technology is perceived to provide benefits to the individual user, while perceived ease of use refers to the degree to which using a specific application system is believed to enhance performance in the organizational context. Usability perception is the level of belief that using a particular technology will yield benefits or have a positive impact. Research on the intention to use IoT has found that perceived usefulness is a more significant predictor than perceived ease of use (Koufaris, 2002).

(b) Perceived ease of use

According to Davis, perceived ease of use as the extent to which an individual believes that a technology is easy to understand and use. In contrast, Jogiyanto (2007) defines perceived ease of use as the degree to which an individual believes that the use of technology will not require much effort, such that if a person believes that an information system is easy to use, they are more likely to use it. Gao and Bai (2014) examined the impact of ease of use on the intention to use IoT applications. Additionally, studies by Hsu and Lu (2004) and Venkatesh (2012) found that perceived ease of use has a positive influence on the intention to adopt IoT.

2.5 Conceptual Framework

Based on TAM and significant findings from previous empirical studies, this study proposed a conceptual framework as depicted in figure 1. Based on this framework, the independent variables are the perceived usefulness and perceived ease of use. The dependent variable is Intention to Use Internet of Things (IoT) in Smart Home.

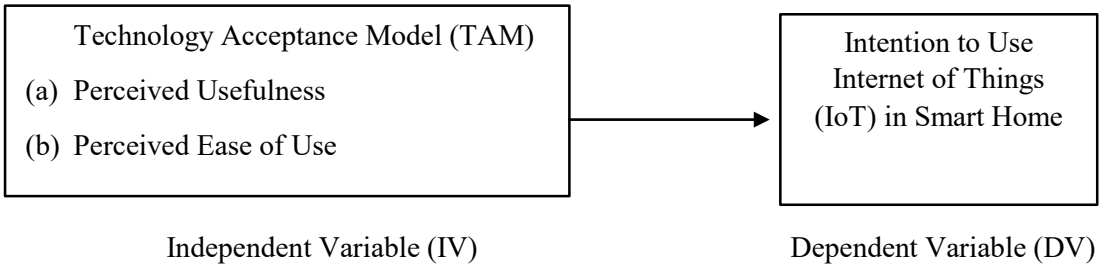

Figure 1: Conceptual framework

3.0 Research Methodology

This chapter will discuss the theoretical method in this research. Various definitions had been used in this research in the part of literature review, research methodology, and research process. The methodology is a particular study that covers the entire process of the research. Besides, the methodology is defined as a regular process in doing research such as collecting data, analyzing data, and interpreting the data.

3.1 Research Design

Research design refers to the method used to obtain the information from the respondent. The collection information used to answer the research questions and solve the research objective. The research design is a deterministic type whose main objective to describe something that can usually be observed by the relation of the study. In this study, quantitative methods were chosen for the research design of this study. This is because the quantitative approach allows the researcher to examine the intention to use smart home Internet of Things (IoT). The information and result collected from the respondents among Generation Y in Johor and would analyzed by SPSS software to achieved the purpose study that is the intention to use smart home Internet of Things (IoT).

3.2 Data Collection

Data must be collected in a right way in order to obtain a higher accuracy. In this study, the researcher will use both source of data. Which are primary data and secondary data. The following sub section discuss details in each sources.

(a) Primary data

According to Anyanwu (2013), research is the systematic and objective collection of data relevant to the solution of recognized issues, as well as the analysis and conversion of the data into knowledge to aid decision makers in making educated marketing choices. Primary data are unprocessed raw data that have yet to be interpreted in any meaningful way. There are several methods of collecting primary data such as observation method, interview method, questionnaire, and others. However, in this research, the researcher is using a questionnaire to collect the primary data sources. By using a questionnaire, the researcher gets closer to the object of study.

(b) Secondary data

Secondary data refers to the source that had already been published in other form. This is useful for the study design of subsequent primary data and can provide a baseline that can be compared to the primary data results collected (Kabir, 2016). Secondary data were grouped into four categories which included government or semi-government publications, earlier research, personal records and mass media. Common sources of secondary data used in the research such as books, journal articles, newspapers, statistics via government website and so on. In this study, secondary data are gathered through journal articles and statistics via government website.

3.3 Data Analysis

In this study, the researcher used SPSS software to analyse the data collected from the respondents. Statistical Package for the Social Sciences (SPSS) software is a tool that helps the researcher to analyse the data quantitatively. It can manage and analyse a huge amount of data from the respondents. It will directly show the result in a table or graphical chart and help the researcher more clearly when analysing the data.

(a) Descriptive analysis

Descriptive analysis contribute a basic summary of the data and information into more concise form. In this research, descriptive statistics are used to find the mean, standard deviation, maximum and minimum value of sampling. Moreover, descriptive statistics is a quantitative description of the main features of the information collection. Descriptive analysis is very important to the researcher simply refer to the raw data, it is difficult to visualize what the data is convey and shows. With the descriptive analysis, the researcher able to look the information simpler and faster.

(b) Correlation analysis

In this research, the researcher use correlation analysis to determine the relationship between perceived usefulness with intention to use Internet of Things (IoT) and the relationship between perceived ease of use with intention to use Internet of Things (IoT). If the results indicate a strong or high value of correlation means that two variables have a strong relationship with each other. If low value of correlation means that two variables are hardly related. The correlation coefficient is a value between -1 and +1. A correlation coefficient of +1 indicates a perfect positive correlation. However, if the value if 0.00, this mean two variables are no relationship in the research.

4. Results and Discussion

4.1 Demographic Analysis

Table 1: Demographic Information of Respondents

Demographic	Details	Frequency	Percentage (%)
Gender	Male	122	42.1
	Female	168	57.9
Age	26 - 30	117	40.3
	31 - 35	135	46.6
	36 - 41	38	13.1
Ethnicity	Malay	81	27.9
	Chinese	165	56.9
	India	38	13.1
	Other	6	2.1
Level of Education	Professional	7	2.4
	Master Level	17	5.9
	Graduate Level	135	46.6
	Higher Secondary Level	130	44.8
	Secondary Level and below	1	0.3
Occupation	Self-Employed	28	9.7
	Employee – Government Sector	19	6.6
	Employee – Private Sector	173	59.7
	Household Wife / Husband	36	12.4
	Student	34	11.7

The table1 shows the demographic information of respondents. The table shows the number of male respondents a total of 122 respondents while the total number of female respondents is 168 respondents out of 290. Thus, 42.1% are male respondents which are lower than female respondents which is 57.9%. The respondents are between 26 to 30 years old which are 117 respondents and 40.3% of the total sample size. The respondents between 31 to 35 years old as a largest of respondents which is 135 person

or 46.6% of the respondents. The following respondents between 36 to 41 years old which is 38 respondents or 13.1%. the number of Malay respondents a total of 81 respondents that is 27.9% while the total number of Chinese respondents is 165 out of 290 that is 56.9% Besides that, the total number of Indian respondents is 38 out of 290 that is 13.1% and the number of other ethnicity respondents is 6 out of 290 that is 2.1%. Most respondents are Graduate Level which are 135 respondents and 46.6% of the total sample size. The sequence followed by respondents from Higher Secondary Level as a second largest of respondents which is 130 persons or 44.8% of the respondents. The following respondents from Master Level which is 17 respondents or 5.9%. Professional Level have 7 respondents which is 2.4% and Secondary Level and below have 1 respondent or 0.3%. Most respondents are the employee from private sector which is 173 respondents and 59.7% of the total sample size. The sequence following by respondent is household wife or husband as a second largest of respondents which is 36 persons or 12.4%. The following respondents is student which is 34 respondents or 11.7%. Besides that, respondents that self-employed which is 28 respondents or 9.7% and respondents that are employee from government sector which is 19 person or 6.5%.

(a) Descriptive Data for Level of Intention to use Internet of Things (IoT)

Table 2 Intention to use Internet of Things (IoT) Descriptive Analysis

	Statement	Mean	Standard Deviation	Interpretation
1.	I know about Smart Home Internet of Things (IoT).	4.09	0.587	High
2.	I am interesting about Smart Home Internet of Things (IoT)	4.20	0.645	High
3.	I ever used Smart Home Internet of Things (IoT).	4.04	0.677	High
4.	I prefer to use Smart Home Internet of Things (IoT) in daily life.	4.20	0.625	High
5.	I will expect to use Smart Home Internet of Things (IoT) in the future.	4.23	0.588	High
6.	I recommend the Smart Home Internet of Things (IoT) to my relatives and friends.	4.21	0.659	High
	Total Average	**4.16**	**0.630**	**High**

The statement of I will expect to use Smart Home Internet of Things (IoT) in the future is the highest mean which is 4.23 and standard deviation is 0.588 while the second highest mean is I recommend the Smart Home Internet of Things (IoT) to my relatives and friends is 4.21 and standard deviation is 0.659. Next, the statement of I am interesting about Smart Home Internet of Things (IoT) which is 4.20 and standard deviation is 0.645. The mean same in 4.20 and standard deviation is 0.625 which the statement is I prefer to use Smart Home Internet of Things (IoT) in daily life. The mean for the statement that I know about Smart Home Internet of Things (IoT) is 4.09. The lowest mean is 4.04 and standard deviation is 0.677 which is the statement that I ever used Smart Home Internet of Things (IoT).

(b) Descriptive Data for Perceived Usefulness with Intention to Use Internet of Things (IoT)

Table 3 Perceived Usefulness with Intention to Use Internet of Things (IoT) Descriptive Analysis

	Statement	Mean	Standard Deviation	Interpretation
1.	Using the Smart home Internet of Things (IoT) would enable me to make my life easier.	4.31	0.572	High
2.	Using Smart home Internet of Things (IoT) would make it easier for me to greater control of energy use.	4.25	0.578	High
3.	Using Smart home Internet of Things (IoT) would significantly increase the quality or output of my life.	4.23	0.608	High
4.	Using Smart home Internet of Things (IoT) will be worthwhile	4.24	0.646	High
5.	Overall, I would find using Smart home Internet of Things (IoT) to be advantageous.	4.30	0.590	High
	Total Average	**4.27**	**0.599**	**High**

The statement of using the smart home Internet of Things (IoT) would enable me to make my life is the highest mean which is 4.31 and standard deviation is 0.572 while the second highest mean is overall, I would find using Smart home Internet of Things (IoT) to be advantageous is 4.30 and standard deviation is 0.590. Next, the statement of using Smart home Internet of Things (IoT) would make it easier for me to greater control of energy use which is 4.25 and standard deviation is 0.578. The mean for the statement that using Smart home Internet of Things (IoT) will be worthwhile is 4.24 and standard deviation is 0.646. The lowest mean is 4.23 and standard deviation is 0.608 which is the statement that using smart home Internet of Things (IoT) would significantly increase the quality or output of my life.

(c) Descriptive Data for Perceived Ease of Use with Intention to Use Internet of Things (IoT)

Table 4: Perceived Ease of Use with Intention to Use Internet of Things (IoT) Descriptive Analysis

	Statement	Mean	Standard Deviation	Interpretation
1.	Learning to use Smart home Internet of Things (IoT) is easy for me.	4.30	0.568	High
2.	I find my interaction with the Smart home Internet of Things (IoT) clear and understandable.	4.27	0.591	High
3.	I think using Smart home Internet of Things (IoT) is easy.	4.28	0.607	High
4.	The procedures of Smart home Internet of Things (IoT) are simple to me.	4.24	0.605	High
5.	I can quickly become proficient in using Smart home Internet of Things (IoT).	4.30	0.580	High
6.	The interface of Smart home Internet of Things (IoT) is user-friendly.	4.31	0.618	High
	Total Average	**4.28**	**0.595**	**High**

The statement of the interface of Smart home Internet of Things (IoT) is user-friendly is the highest mean which is 4.31 and standard deviation is 0.618 while the second highest mean is I can quickly become proficient in using Smart home Internet of Things (IoT) is 4.30 and standard deviation is 0.580. Next, the statement of learning to use Smart home Internet of Things (IoT) is easy for me which is 4.30

and standard deviation is 0.568. The mean for the statement that I think using Smart home Internet of Things (IoT) is easy is 4.28 and standard deviation is 0.607. The mean for the statement that I find my interaction with the Smart home Internet of Things (IoT) clear and understandable is 4.27 and standard deviation is 0.591. The lowest mean is 4.24 and standard deviation is 0.580 which is the statement that I can quickly become proficient in using Smart home Internet of Things (IoT).

4.2 Normality Test

Table 5: Result of normality test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Dependent Variable	Statistic	df	Sig.	Statistic	df	Sig.
Intention to Use Internet of Things (IoT)	.230	290	.000	.885	290	.000

a. Lilliefors Significance Correction

Based on the Table 5, the p-value for the dependent variable that intention to use Internet of things (IoT) is 0.000. The result of the test for normality shows that the p-values for the dependent variables are less than 0.05. Since data is not normally distributed, this study will proceed with the Spearman correlation analysis.

4.3 Correlation Analysis

Table 6: Result of Spearman' Correlation

	Perceived Usefulness	Perceived Ease of Use	Intention to Use Internet of Things (IoT)
Perceived Usefulness	1.000	.709**	.613**
Perceived Ease of Use	.709**	1.000	.601**
Intention to Use Internet of Things (IoT)	.613**	.601**	1.000

**Correlation is significant at the 0.01 level (2- tailed).

The function of the correlation analysis was to evaluate the relationship between two or more variables. It was evaluated that used the data collected from the respondents. Statistics helps to discover the strength of the relationship between two or more variables (Kumar, 2016). Table 4.8 shows the results of Spearman's Correlation Coefficient, (r = 0.613) which was a strong relationship between perceived usefulness and intention to use internet of things (IoT). The correlation analysis supports a significant positive relationship between perceived usefulness and intention to use Internet of Things (IoT). Therefore, H1 is supported.

Furthermore, there is a strong relationship between perceived ease of use and intention to use internet of things (IoT) where the (r = 0.601). The correlation analysis supports a significant positive relationship between perceived ease of use and intention to use Internet of Things (IoT). Therefore, H2 is supported.

4.4 Summary of hypotheses

Based on the correlation analysis results, hypothesis testing results for H1 to H2 are shown in Table 4.9 as below:

Table 7: Summary of hypotheses

Hypotheses	Result
H_1 : There is a relationship between perceived usefulness and intention to use Internet of Things (IoT).	Supported
H_2 : There is a relationship between perceived ease of use and intention to use Internet of Things (IoT).	Supported

5. Conclusion

The research objective in this research is to find the relationship between perceived usefulness, perceived ease of use and intention to use Internet of Things (IoT) among Generation Y in Johor. Internet of Things (IoT) in smart home focus on increasing the home comfort, improving the quality of life and enhancing personal experience. Internet of Things (IoT) in smart home will become more popular, more accessible, and easier to use through the development of information technology.

5.1 Limitation of Study

There are some challenges and limitation to complete this research. The limitations is the time consideration had limited the number of respondents. The data collection period for this research is only about three months. Next is limited data collection which the target respondents should be Generation Y from Johor. It is only limited respondents willing to cooperate on answering the questionnaires. Some of the respondents are not familiar in using google form.

5.2 Recommendations

There are limited number of respondents and lack of evidence to support this research. The research is focused on the relationship between perceived usefulness, perceived ease of use and intention to use Internet of Things (IoT) among Generation Y in Johor. Thus, it is recommended to expand the topic with the same objectives which to develop more relevant questions in questionnaire. Secondly, a good time management to complete the research and expand the time for data collection procedure. The researcher only focuses on one state only then the feedback from the respondents would limit. Future research is recommended to focus on Malaysia, in this way, the researcher able to get accurate data from respondents because the larger the sample size, the results will be more accurate and reliable. Last but not least, the future research is encouraged to use different method which is combination of both quantitative and qualitative methods to collect the data and answer all the research questions. The mixed method will add valuable information that able to make the researcher understand more deeply in the future research.

Acknowledgement

The authors would also like to thank the Technology Management Focus Group and Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia for its support.

References

Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes. Psychological bulletin, 82(2), 261.

Albert, L. J., Rodan, S., Aggarwal, N., & Hill, T. R. (2019). Gender and Generational Differences in Consumers' Perceptions of Internet of Things (IoT) Devices. E-Journal of Social & Behavioural Research in Business, 10(3).

Anyanwu, J. C. (2013). Characteristics and macroeconomic determinants of youth employment in Africa. African Development Review, 25(2), 107-129.

Chang, C. Z., Zhang, J., Feng, X., Shen, J., Zhang, Z., Guo, M., ... & Xue, Q. K. (2013). Experimental observation of the quantum anomalous Hall effect in a magnetic topological insulator. Science, 340(6129), 167-170.

Chou, C. H., Shrestha, S., Yang, C. D., Chang, N. W., Lin, Y. L., Liao, K. W., ... & Huang, H. D. (2018). miRTarBase update 2018: a resource for experimentally validated microRNA-target interactions. Nucleic acids research, 46(D1), D296-D302.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS quarterly, 319-340.

Eagly, A. H., & Chaiken, S. (1993). The psychology of attitudes. Harcourt brace Jovanovich college publishers.

French, A. M., & Shim, J. P. (2016). The digital revolution: Internet of things, 5G, and beyond. Communications of the Association for Information Systems, 38(1), 40.

Ha, S., & Stoel, L. (2009). Consumer e-shopping acceptance: Antecedents in a technology acceptance model. Journal of business research, 62(5), 565-571.

Hande, S. (2019). The informal waste sector: a solution to the recycling problem in developing countries. Field Actions Science Reports. The Journal of Field Actions, (Special Issue 19), 28-35.

Hong, H. G. (2016). Analysis of business framework for Internet of Things. Indian Journal of Science and Technology, 9(37), 1-5.

Horrigan, J. O. (1987). The ethics of the new finance. Journal of Business Ethics, 6, 97-110.

Hsu, C. L., & Lin, J. C. C. (2016). An empirical examination of consumer adoption of Internet of Things services: Network externalities and concern for information privacy perspectives. Computers in Human Behavior, 62, 516-527.

Kim, D., Kim, J., Hur, J. K., Been, K. W., Yoon, S. H., & Kim, J. S. (2016). Genome-wide analysis reveals specificities of Cpf1 endonucleases in human cells. Nature biotechnology, 34(8), 863-868.

Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. Information systems research, 13(2), 205-223.

Kumar, S., Stecher, G., & Tamura, K. (2016). MEGA7: molecular evolutionary genetics analysis version 7.0 for bigger datasets. Molecular biology and evolution, 33(7), 1870-1874.

Liew, C. S., Ang, J. M., Goh, Y. T., Koh, W. K., Tan, S. Y., & Teh, R. Y. (2017). Factors influencing consumer acceptance of internet of things technology. In The internet of things: Breakthroughs in research and practice (pp. 71-86). IGI Global.

Lingling Gao Xuesong Bai , (2014),"A unified perspective on the factors influencing consumer acceptance of internet of things technology", Asia Pacific Journal of Marketing and Logistics, Vol. 26 Iss 2 pp. 211 - 231 Permanent link to this document: http://dx.doi.org/10.1108/APJML-06-2013-0061

Liu, J., Platts-Mills, J. A., Juma, J., Kabir, F., Nkeze, J., Okoi, C., ... & Houpt, E. R. (2016). Use of quantitative molecular diagnostic methods to identify causes of diarrhoea in children: a reanalysis of the GEMS case-control study. The Lancet, 388(10051), 1291-1301.

Liza, A., Jogiyanto, H., Syaiful, A., & Ratna, N. (2007). Information disclosure readability, cognitive style, and investment decision making: A web experimental study. Advances in Economics, Business and Management Research, volume 135, 135(1), 135-138.

Ricquebourg, V., Menga, D., Durand, D., Marhic, B., Delahoche, L., & Loge, C. (2006, December). The smart home concept: our immediate future. In 2006 1st IEEE international conference on e-learning in industrial electronics (pp. 23-28). IEEE.

Schlick, J., Ferber, S. and Hupp, J. (2013), IoT Applications – Value Creation for Industry, River Publisher, Aalborg.

Uckelmann, D., Harrison, M. and Michahelles, F. (2011), "An architectural approach towards the future internet of things", in Uckelmann, D., Harrison, M. and Michahelles, F. (Eds), Architecting the Internet of Things, Springer, Berlin, pp. 1-24.

Uckelmann, D., Harrison, M., & Michahelles, F. (2011). An architectural approach towards the future internet of things. In Architecting the internet of things (pp. 1-24). Berlin, Heidelberg: Springer Berlin Heidelberg.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly, 157-178.

Welle, D. (2012). Internet of things' holds promise, but sparks privacy concerns.
Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. Journal of marketing, 60(2), 31-46.
Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. Journal of marketing, 60(2), 31-46.
Zhiting Lin, Liang Dong (2014), Clarifying Trust in Social Internet of Things https://doi.org/10.1109/TKDE.2017.2762678